

In re Patent Application of
MONTGOMERY
Serial No. 10/631,271
Filed: JULY 31, 2003

REMARKS

Applicant thanks the Examiner for the careful and thorough examination of the present application, and for the indication of allowable subject matter. By this amendment, Claims 4 and 29 have been amended to eliminate minor informalities contained therein. Also, the title has been amended to be more specific as requested by the Examiner. Claims 1-38 remain pending in the application. Favorable reconsideration is respectfully requested.

I. The Invention

Referring to FIGS. 2 and 3, for example, the disclosed invention is generally directed to profiling targets, such as space-based antenna, that are not readily profiled with a conventional interferometer.

Independent Claim 1 is directed to an optical profile determining apparatus comprising an optical detector, and an optical source for generating a transmit beam comprising a plurality of wavelengths, and for generating a reference beam comprising the plurality of wavelengths. At least one optical element directs the transmit beam to a target, directs a resulting reflected transmit beam back from the target to the optical detector, and combines the reference beam with the reflected transmit beam so that a profile of the target is based upon fringe contrast produced by the plurality of wavelengths in

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the reference beam and the plurality of wavelengths in the reflected transmit beam.

Similarly, independent Claim 15 is directed to an optical profile determining apparatus including a plurality of lasers for generating a plurality of individual transmit beams, each laser operating at a different wavelength. A multiplexer multiplexes the plurality of individual transmit beams into a combined transmit beam, and a splitter downstream from the multiplexer splits the combined transmit beam into a first beam and a second beam, the first beam defining a transmit beam. A delay circuit is downstream from the splitter for delaying the second beam to define a reference beam. Again, at least one optical element directs the transmit beam to a target, directs a resulting reflected transmit beam back from the target to the optical detector, and combines the reference beam with the reflected transmit beam so that a profile of the target is based upon fringe contrast produced by the plurality of wavelengths in the reference beam and the plurality of wavelengths in the reflected transmit beam.

Independent method Claim 27 is directed to method for determining a profile of a target including generating a transmit beam comprising a plurality of wavelengths, and generating a reference beam comprising the plurality of wavelengths. The method includes directing the transmit beam to a target, directing a resulting reflected transmit beam back from the target to an optical detector, and combining the

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reference beam with the reflected transmit beam so that a profile of the target is based upon fringe contrast produced by the plurality of wavelengths in the reference beam and the plurality of wavelengths in the reflected transmit beam.

II. The Claims are Patentable

Claims 1-4, 11-16, 23-29, 35, 37 and 38 were rejected in view of Hochberg et al. (U.S. 5,071,251) taken alone or in combination with Ge (U.S. Patent Publication 2001/0049709) for the reasons set forth on pages 3-6 of the Office Action. Applicant contends that Claims 1-4, 11-16, 23-29, 35, 37 and 38 clearly define over the cited references, and in view of the following remarks, favorable reconsideration of the rejections under 35 U.S.C. §102 and §103 is requested.

As discussed above, each of the independent claims at least includes a transmit beam comprising a plurality of wavelengths, a reference beam comprising the plurality of wavelengths, and combining the reference beam with the reflected transmit beam so that a profile of the target is based upon fringe contrast produced by the plurality of wavelengths in the reference beam and the plurality of wavelengths in the reflected transmit beam. It is these combinations of features which are not fairly taught or suggested in the cited reference and which patentably define over the cited reference.

The Examiner has relied on the Hochberg et al. patent as allegedly disclosing the claimed invention. The Hochberg et

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al. patent utilizes an optical train which comprises three off-axis parabolas arranged in conjunction with a beam-splitter and a reference mirror to form a Twyman-Green interferometer. An illumination subsystem is provided and comprises a pair of lasers at different preselected wavelengths in the visible spectrum.

However, the Examiner has mischaracterized the cited reference as there is no teaching that the transmit beam and the reference beam each comprise a plurality of wavelengths, as claimed. Therefore, the reference cannot teach combining the reference beam with the reflected transmit beam so that a profile of the target is based upon fringe contrast produced by the plurality of wavelengths in the reference beam and the plurality of wavelengths in the reflected transmit beam.

As the Examiner is aware, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

The Ge patent was relied upon by the Examiner as teaching the use of wavefront tilting. Without discussing the Ge reference in detail, it is sufficient to note that such reference also does not teach the use of a transmit beam and the reference beam each comprising a plurality of wavelengths, as claimed. Accordingly, the Ge reference does not make up for the

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deficiencies of the Hochberg et al. reference as pointed out above.

There is simply no teaching or suggestion in the cited references to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicant maintains that the cited references do not disclose or fairly suggest the invention as set forth in Claims 1, 14 and 27. Furthermore, no proper modification of the teachings of these references could result in the invention as claimed. Thus, the rejections under 35 U.S.C. §102(b) and §103(a) should be withdrawn.

It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

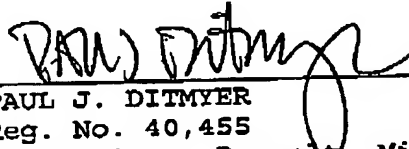
III. Conclusion

In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining informalities which need to be resolved before the application can be passed to issue, the Examiner is invited and respectfully

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requested to contact the undersigned by telephone in order to
resolve such informalities.

Respectfully submitted,


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CERTIFICATE OF FACSIMILE TRANSMISSION

I HEREBY CERTIFY that the foregoing correspondence has been
forwarded via facsimile number 571-273-8300 to the Commissioner
for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 this 9th
day of September, 2005.

